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WATER SUPPLY AND POLLUTION CONTROL STUDY

SUMMARY REPORT

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JULY 1968

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Southern Ontario county and  
region water supply and  
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summary report.

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WATER SUPPLY AND POLLUTION CONTROL STUDY

SUMMARY REPORT

JULY 1968.

### ACKNOWLEDGEMENT

The co-operation and advice received during the preparation of this report from employees and representatives of the Provincial Government Departments contacted and the Counties and Municipalities in the study area is gratefully acknowledged. The assistance of the Central Ontario Joint Planning Board was especially appreciated.

## INTRODUCTION

A study of the water supply and pollution control requirements of a 375 square mile area immediately east of Metropolitan Toronto was completed early in 1968. Shortly thereafter, the Province of Ontario published a regional planning report which was prepared in conjunction with the Metropolitan Toronto and Region Transportation Study (MTARTS). This latter report is much broader in scope and presents several choices for the pattern of growth in the area. At the time the Commission study was initiated, there was no indication that a regional plan encompassing a large portion of the Province might become a reality. Since it appears that development over a broad region will be better staged and planned in the future, the OWRC study projections, based on past trends, are not necessarily valid any longer. Therefore it was decided to provide a summary of the results of the water supply and pollution control study to avoid confusion.

The following summary, therefore, outlines the immediate water supply and pollution control requirements of the area which will not be influenced to any great degree by the choice of the pattern for ultimate development. Also presented are philosophies for servicing the area ultimately which will apply regardless of the chosen pattern of development.

## DESCRIPTION OF STUDY AREA

The physical boundaries of the study area in general are the watershed divide between the Duffin and Petticoat Creeks and the Rouge River on the west, the watershed divide between the north and south flowing watersheds on the north and the watershed divide between the Soper Brook and Wilmot Creek on the east. Lake Ontario forms the southern boundary. The area approximates a rectangle 28 miles long east to west by 14 miles wide north to south.

This area includes the City of Oshawa, the Towns of Ajax, Bowmanville and Whitby, the Villages of Pickering and Stouffville, and the Townships of Darlington, Pickering, Whitby East and the southern portion of Uxbridge.

The attached map outlines the study area, the municipal boundaries, the watershed boundaries and the existing and suggested water works and water pollution control plants.

### Growth

During the past 15 years, the expansion of the area has been extensive. Population growth rates have varied from 3.43 per cent to 6.23 per cent per year in the urban areas and from 2.40 per cent to 7.44 per cent per year in the rural areas. In comparison, the rate of increase in the population of the Province of Ontario has averaged 2.9 per cent per year over the same period.

Various estimates of the future population in the area range from 340,000 in 1987 as estimated during this study to anywhere from 540,000 to 850,000 in the year 2000 as estimated in the MTARTS report "Choices for a Growing Region". The 1967 assessed population of the area was 176,000 persons.

#### Land Use

As previously stated in the introduction, several choices have been proposed for the pattern of development in the area. During the course of the study, several areas were isolated because of servicing problems. The very limited flow in both Carruthers Creek and the western part of Lynde Creek indicate that in order to maintain the present condition of these watercourses it would be preferable to restrict development in both. From a brief review of basic planning concepts, it is apparent that maintenance of these two watersheds as greenbelt would provide an ideal barrier between the Metro-oriented Pickering-Ajax area and the more independent Whitby-Oshawa area.

A series of very small creeks drain the area between Oshawa and Bowmanville. South of Highway 401, this area has been designated for industrial development. It is anticipated that the type of industry that will locate here would provide its own services. The provision of sewerage services to the area north of the Macdonald-Cartier Freeway would be complicated



and costly. Therefore, it would appear to be reasonable to restrict development in this area to estate-type residential on large lots with individual services. Aside from these two specific areas, adequate water supply and pollution control services can probably be provided along the shore of Lake Ontario to support continued urbanization. Development in the headwater zones of all of the watersheds should be very carefully controlled as it would appear to be too costly to extend the Lake Ontario-oriented water and sewer services to these areas.

#### Water Supply

In general, the study indicated that ground-water supplies were not adequate in the southern part of the area to support the anticipated urbanization. Lake Ontario became the logical source therefore, as it is the only large body of water of sufficiently good quality to meet the demands. Ground-water resources were found to be more plentiful in the north where they should be able to support some further development in the rural communities.

Within the study area, there are nine water works presently in operation. Two of these are private well supplies serving subdivisions in the Township of Whitby East. These are not suitable for extensive enlargement and will be phased out of operation as the municipal systems are extended. A third water works, the Rouge Hill system in the Township of

Pickering, also is not suitable for incorporation into an area system. Of the remaining six, the ground-water supply serving the Community of Brooklin will probably remain in service for at least 20 years until a lake supply is extended northward to the area. The other five water works serving the City of Oshawa, the Towns of Ajax, Bowmanville and Whitby and the Township of Pickering will remain in operation and be extended as the demands increase. All of these water works utilize Lake Ontario for water supply and will continue to do so.

To facilitate operation and extension of the five water systems in the urban centres, it will be desirable to inter-connect the adjoining water distribution systems in corresponding pressure zones. This, in effect, will result in two larger systems being developed, one to serve the Pickering-Ajax area, and the other to serve the Whitby-Oshawa area. The Bowmanville system will continue to serve the town and possibly be extended into the surrounding areas of the Township of Darlington.

The wells which supply water to the Village of Stouffville are located in the Rouge River Watershed. A previous report which included that watershed indicated that there was sufficient ground water in the immediate vicinity of the village to meet the expected future demands.

### Pollution Control

With few exceptions, it has been determined that none of the watercourses in the area can receive significant quantities of treated waste effluents. The exceptions include Duffin Creek at Stouffville where a high degree of treatment and effluent aeration may permit a discharge in excess of 1 mgd, and Soper Brook at Bowmanville where additional data collected in the future will determine the allowable waste loading more reliably. The other water pollution control plants that are to remain in operation indefinitely and any new plants that are to be constructed in the future must discharge their effluents directly to Lake Ontario via outfall sewers extending into the lake.

Five of the nine existing water pollution control plants should be phased out of operation for various reasons. It is doubtful that these plants would be built today unless they were considered to be temporary installations designed to meet immediate needs until a better solution became economically feasible. These include the Bay Road WPCP in the Township of Pickering, the Town of Ajax WPCP, the Town of Whitby WPCP, the Georgian Motor Hotel WPCP and the Pine Ridge School WPCP. Similarly, the works under construction in the Village of Pickering should be considered as temporary facilities.

Future sewage works must be designed and built to serve drainage areas, rather than political boundaries, if long-term economies are to be realized. Facilities that will be extremely expensive to duplicate in the future, such as trunk sewers, must provide sufficient capacity when constructed to be adequate for the useful life of the works. All works built should conform to a long-range plan. Where plants, forcemains or pumping stations are required to alleviate an existing problem but do not fit into the ultimate scheme, it must be acknowledged that these are temporary and these should be designed accordingly keeping expenditures to a minimum.

Ultimately, the Pickering-Ajax area probably will be served by only two water pollution control facilities, one near the mouth of Duffin Creek and the other either near the mouth of Petticoat Creek or in Metropolitan Toronto. Likewise, it is expected that the Whitby-Oshawa area will contribute flows to plants at the mouth of Corbett Creek and at the present location of the City of Oshawa WPCP. The Ontario Hospital WPCP will remain in operation. With the additional load imposed by the proposed new general hospital, the operation and efficiency of this plant should improve since the facility will be approaching its hydraulic and organic design capacity. The area south of the Macdonald-Cartier Freeway

in the Township of Darlington will probably be served by individual industrial pollution control facilities. Care will have to be taken in the design and operation of the Stouffville WPCP. The planning authority for the village will have to ensure that development does not occur that would produce a waste loading beyond the assimilation capacity of the upper reaches of Duffin Creek. All of the wastes in the Bowmanville Creek and Soper Brook Basins should be directed to the existing Bowmanville WPCP. An outfall extending into Lake Ontario may be required in the future.

#### RECOMMENDATIONS

##### General

1. Urban development should be encouraged only in areas where both water supply and pollution control services oriented to Lake Ontario can be provided.
2. Development should be controlled to ensure that it coincides with the staging of the water supply and pollution control facilities which in turn should coincide with each other.
3. The extent of the area to be ultimately serviced should be clearly defined.
4. Areas outside of the defined serviced area should be restricted to rural or open space uses. In general, this will apply to the headwater zones of all of the watersheds and

those watersheds where only minimal streamflows occur throughout the drainage basin (i.e. Carruthers and Lynde Creeks; creeks east of Oshawa).

5. Some further development could be allowed in rural communities providing that the lot sizes are amenable to the services available. As a guideline, it is suggested that one-acre lots would be minimal where individual wells and septic tank systems are the only services available.

6. The measures proposed by the Conservation Authorities in the area should be actively pursued to provide continuous streamflow in the numerous watercourses. This will ensure that the water quality in the streams will be satisfactorily maintained even though some natural pollution and storm drainage is certain to reach the streams. Direct discharges of wastes and treated effluents to the streams should be prevented unless it is determined positively that there is sufficient streamflow to assimilate such discharges.

#### Water Supply

##### Pickering-Ajax

1. The water distribution systems in the Township of Pickering, the Village of Pickering and the Town of Ajax should be inter-connected and operated as a single system.

2. Connections should also be made to the Metropolitan Toronto distribution system in order to reinforce the western end of the existing Township of Pickering distribution system, if satisfactory arrangements can be made.

3. The Sherman-Scott and Ajax water purification plants should be enlarged as required to meet the future demands of the area. When new intakes are needed, limnological studies should be conducted to determine the best location, length and depth for the intakes.

4. The Rouge Hill water works should be phased out of operation.

5. The storage facilities in the distribution system should be expanded as soon as possible to provide adequate capacity for fire and emergency purposes.

#### Whitby-Oshawa

1. The water distribution systems serving the Town of Whitby and the City of Oshawa should be inter-connected and operated as a single system.

2. The Whitby and Oshawa water purification plants should be enlarged as required to meet the future demands of the area. When new intakes are required, limnological studies should be conducted to determine the best location, length and depth for the intakes.

3. The private water works serving the Sherwood Park and Sun Valley Heights subdivisions should be phased out of operation.

4. Extensive development in the vicinity of the Community of Brooklin should be discouraged until it becomes practical to extend the area water supply system to it. In the interim, the available ground-water resources should be adequate.

5. The storage facilities in the distribution system should be expanded as soon as possible to provide adequate capacity for fire and emergency purposes.

#### Bowmanville

1. Filtration facilities should be provided at the Bowmanville water works since Lake Ontario will become the principle source of supply in the future.

2. The entire purification plant should be enlarged as required to meet the future demands of the area. When a new intake is required, a limnological study should be undertaken to determine the most suitable location, length and depth for the intake.

3. The storage facilities in the distribution system should be expanded as soon as possible to provide adequate capacity for fire and emergency purposes.



## Pollution Control

### Stouffville

1. The capacity of the Stouffville WPCP should be doubled. Storm holding tanks for flow equalization and sand filtration and effluent aeration for effluent polishing should also be provided.

2. All phases of planning for the village should be reviewed periodically to ensure that development is not permitted which will generate sewage flows in excess of the plant and stream capacities.

### Pickering-Ajax

1. The western portion of this area lying within the Rouge River and Petticoat Creek Watersheds and possibly part of the central watershed above Frenchman Bay should be sewered to one of the following three alternative water pollution control plants: (a) the Metropolitan Toronto Highland Creek WPCP; (b) a plant to be built to serve the Central York area which could possibly be located near the mouth of Petticoat Creek; or (c) a new plant to serve the entire Pickering-Ajax area to be located at the mouth of Duffin Creek.

2. A new water pollution control plant should be constructed at the mouth of Duffin Creek to serve all the anticipated development in the watershed and also

the anticipated development in the smaller watersheds to the west of Duffin Creek. This will provide sewer services for the entire Town of Ajax and the Village of Pickering and the areas of the Township of Pickering north and east of Frenchman Bay.

3. Any extensions or modifications to the Bay Road WPCP in the Township of Pickering and the Ajax WPCP which may become necessary before the suggested plant at the mouth of Duffin Creek is operational, should be designed as temporary facilities only, keeping expenditures to a minimum. If for some reason it is decided that the Ajax WPCP should remain in operation indefinitely, an outfall sewer extending from the plant into Lake Ontario should be constructed.

4. The Pickering Village WPCP should be considered a temporary facility to be removed from service when lake-oriented pollution control facilities serving a large area are available in the Duffin Creek Basin.

#### Whitby-Oshawa

1. An outfall extending into Lake Ontario should be constructed at the Ontario Hospital WPCP in the Town of Whitby. This plant will remain in operation to treat the sewage from the Ontario Hospital and the proposed new general hospital.

2. The existing Whitby WPCP should be expanded to meet the immediate needs only. It is anticipated that a total capacity of approximately 3.0 mgd would be suitable. A diversion sewer from the site of the existing Whitby WPCP to direct all flows in excess of approximately 3.0 mgd to the proposed Corbett Creek WPCP should be built when flows to the existing plant regularly exceed the expanded plant capacity.

3. If for any reason it is deemed necessary to expand the Whitby WPCP beyond approximately 3.0 mgd, then an outfall extending into Lake Ontario should be provided.

4. A new water pollution control plant should be built at the mouth of Corbett Creek to serve the lands in the Corbett Creek Watershed, the Pringle Creek Watershed north of Highway No. 2, the Goodman Creek Watershed north of Highway No. 2 and ultimately the entire Town of Whitby, the Brooklin area and the lands draining to the West Branch of the Oshawa Creek north of the City of Oshawa.

5. The Oshawa WPCP should be kept in operation and extended as required to serve the lands in the Goodman Creek Watershed south of Highway No. 2, the Oshawa Creek Watershed within the City of Oshawa, the East Oshawa Creek Watershed north of the City of Oshawa and the Harmony and Farewell Creek Watersheds.

6. An outfall sewer extending from the Oshawa WPCP into Lake Ontario should be constructed. A dispersion study at the lake should be undertaken to assess the optimum outfall length and location.

7. The existing Georgion Motor Hotel WPCP should be taken out of operation when sewers are available in the area.

8. It will be some time before lake-oriented pollution control facilities will be available for the Community of Brooklin. If pollution control facilities must be provided in the interim, they should be considered temporary and should be designed to restrict effluent discharge to periods when adequate streamflow is available to provide satisfactory assimilation.

#### Bowmanville

1. A trunk sewer should be constructed in the Soper Brook Basin to serve the lands draining to the brook including the Department of Reform Institution's Pine Ridge School. The existing water pollution control plant at the school should be removed from service.

2. Studies should be undertaken on the receiving stream below the Bowmanville WPCP south to Lake Ontario to determine the stream's ultimate carrying capacity. If this work indicates an outfall is or will be

required, a dispersion study at the lake should be undertaken to assess the optimum outfall length and location.



